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INTRODUCTORY LECTURE *to a Course of Lectures on Materia Medica, delivered at the Philadelphia Medical Institute.* By Joseph Carson, M. D.

Gentlemen,—In accordance with the arrangement made for the delivery of the course, that portion of it has been allotted to me, which pertains to the subjects proper of the Materia Medica, or, in other words, the articles employed in the treatment of disease. The *Science of Materia Medica*, as its signification is now received, occupies an extended field, and includes within its range many subsidiary departments. The use of the appellation, in a comprehensive sense, has reasonably been objected to, on account of its being indefinite, or conveying but a partial idea, and I am disposed to accord in the propriety of adopting the name *Pharmacology*, which is more generic in character, and more consistent with modern nomenclature. It comprises all the information possessed with regard to medicinal agents, whether relating to their nature and origin, modes of preparation, or effects and application; hence Materia Medica, Pharmacy, and Therapeutics, are the divisions of which it is susceptible, although these are intimately connected and mutually dependent upon each other.

The department of Therapeutics, however, is not restricted to the articles of the Materia, as in the catalogue containing the whole of them, are not enrolled a number of agents which contribute to the resources of the physician; such are blood-letting in its varieties, electricity and galvanism, hygienic measures, as diet, exercise, &c., which, under appropriate circumstances, are equally efficacious in combatting disease; and this leads me to notice the distinction to be made between the terms *medicine* and *remedy*. In trite language I may state that all medicines are remedies, but it does not follow that the converse is the case, nor indeed is it, for it is to be understood that the former expression has a specific reference to a certain class of bodies, while the latter is general, and applied to agents of every description, which may be beneficially employed. Medicines, then, may be explained to be *substances obtained from nature*, which, from their own inherent qualities, possess the power of affecting the living system, of producing a change or modification in the organic and functional actions, and, if they be deranged, of facilitating their return to a healthy condition.

In the present lecture, I design to lay before you a sketch of the methods available in the study of medicines, considered merely as natural productions, or, as this species of information is called, "a history of simple drugs." The substances composing the Materia Medica, are derived from the three kingdoms of nature, the Animal, Vegetable, and Mineral; they have either contributed to the formation of *organized beings*, or are portions of *unorganized brute masses*, and fall within the distinct province of some one of the several branches of science, which are occupied in the examination of the innumerable and varied works of creation. They are treated of under Botany, Zoology, and Mineralogy, and from these sciences, aided by Chemistry and Physics, is borrowed the light by which we are to be guided in the prosecution of our researches; they form the basis of Pharmacology.

Independent as the sciences mentioned may be supposed to be, at first sight, and difficult as they may appear from the immense number of objects, other than those in which we are interested, recognised by each of them, as legitimately appertaining to it, we should recollect that they were originally the offspring of pharmacological investigation, and, for a long time, were inseparable from Medicine, with which they were incorporated; thus we find that the earliest naturalists were physicians, and Theophrastus and Aristotle may be cited as instances. It has only been within a comparatively recent period, that, facilitated by the advance of civilization, they have been cultivated for their own intrinsic merit, yet continuing to exercise an especial influence upon the Materia Medica, which at all times has been benefited by their extension. Let us take a closer view of the subject, and determine in what manner they are auxiliary.

The first medicines must have been derived from the vegetable kingdom, for as this would attract attention, from its multiplied products, and abundant supply of nutritious sustenance, there would arise a necessity to discriminate between what was wholesome or injurious. Attention once awakened, a knowledge of medicines rapidly advanced, by experimental observation of the effects of vegetable substances, by analogy, and perhaps the habits and instincts of animals afforded no inconsiderable assistance in the prosecution of discoveries. But with all nature before him, and daily progressing in intelligence, the capacity of man could not be restricted to a single field of inquiry; ingenuity aided experience, and all matter, whether vegetable, animal, or mineral, became subservient to his purposes. Confidence in the wisdom and beneficence of Providence stimulated his exertions; he was impressed with the belief, that where misery was imposed, the means of alleviation were only to be sought for to be discovered.

The principle of combination, or separation into groups, appears to be universal. The affinity existing between the species composing certain

prominent and easily recognised orders of organic beings, was perceived at an early period, and afforded the data towards the scientific arrangement. From the oldest record of the world, we learn that this separation was made at the beginning; in it we have an account of the creation of "grass and herbs yielding seed," "and the fruit tree yielding fruit," "of moving creatures that have life in the water, of fowl that fly above the earth, and cattle and creeping thing, each of its kind." In proportion as these beings became better known, and their qualities, habits, uses, and modes of life, and propagation understood, the distinctions to be made between such as differed were more clearly defined, and the analogies between such as bore a resemblance more firmly established. Advancing from generals to particulars, the elements of Natural History began to assume form and order. The edifice commenced in remote ages, has gradually been built up by succeeding generations. It is true that the materials have been remodelled, and its aspect changed by the labours of succeeding workmen; but amidst the mutations of time its integrity has been preserved, and it only remains to complete the superstructure, to attract the admiration and veneration of the world.

To comprehend entirely the assistance to be derived from scientific investigation, it will be necessary to consider in succession the different departments of Natural History, and see how far they are adapted to the furtherance of the purposes in view. As the largest proportion of medicines are of vegetable origin, I shall, in the first place, take up Botany.

The study of plants constitutes this science, and in order to render it as complete and accurate as possible, all the particulars relating to them must be attentively examined, and a methodical direction given to researches, otherwise a useless expenditure of toil, with little benefit, would result. Under the latter point of view the utility of Botany is most conspicuous. Although it cannot be expected of us to enter deeply into the science, and to be skilled in all its minutiæ, as this can only be accomplished by those who possess time and taste to pursue it to the full gratification of their curiosity, still some knowledge of its principles will be advantageous. There are several objects to be attained in the prosecution of botanical research. The preliminary step is to recognise plants, and to discriminate between them; they are found to consist of parts, which vary in form, function, and material relations; this then is accomplished by noting the characters of these different parts, and comparing them. To perpetuate and communicate the result of knowledge thus acquired, definitions must be resorted to, indicative of every variety of conformation, and conveying clear ideas of what is intended to be conveyed; a language has therefore been invented, admirably adapted for the purpose intended, in accordance with which, plants are named and described. But this alone is not sufficient to complete the account of the peculiarities; they exhibit among themselves resemblances and discrepancies so evident, and regulated by principles of organization so readily to be detected, that a separation into classes and orders, genera and species, is indispensable to secure a thorough recognition of the alliances which exist between them, and consequently classification, founded upon affinities, furnishes the bond by which the uniformity of the science is preserved, while it confers rank and station, determined by complexity of structure, upon every individual being belonging to the vegetable kingdom.

The advantages derived from the adoption of a comprehensive plan, embracing all the objects of the science, in unfolding which each division has a proper share of importance assigned it, are obvious, when a comparison is instituted between the degrees of improvement presented from time to time, after having been remodelled by the discoveries of the acute and accurate observers, whose lives have been devoted to its cultivation. To the desertion of a partial and contracted method of pursuing inquiries, is to be imputed the fortunate termination of the exertions that have been made to enlarge its limits, and whenever the adaptation of one part to another has been strictly adhered to, they all, collectively, have experienced the benefit, and the whole science has been rendered more profitable in its application. A close correspondence in the manner of *naming*, *describing*, and *classifying* plants, has had the effect of securing to Botany a firm and durable foundation, and this has rigidly been preserved in the works of those who have the highest claims to consideration, as master-builders of the beautiful temple conjointly erected by their industry. The contrast between the botany of the ancients and that of the present age, exemplifies the correctness of these remarks. The former consists of an incomplete account of vegetables, designed to establish and display their medical and sensible properties, without any designation of character, except that of size and habit, with names so inappropriate, or universally applied, and terms of description so vague and loose, as almost to defy the attempt to determine, at subsequent periods, what the originals might have been, while the manner in which they were associated together, was in accordance with actual or fancied powers they possessed upon the functions of life. From these causes, all the information intended to be conveyed was made valueless to succeeding investigators, who were unavoidably coerced to re-construct the science anew, upon principles more solid and lasting, furnished by a faithful examination of all the circumstances calculated to elucidate the elaborate and infinitely variegated modifications of the vegetable world. The systematic labours of Gesner, the Bauhins, Tournefort, and Rivinus, in the 16th and 17th centuries, contributed more to the advancement of the Materia Medica, than did those of all their predecessors, who regarded the study of plants in no other view than as leading to the development of their virtues; for extraordinary as it may appear, the too servile adherence

to the very end desired, was the principal reason of failure in accomplishing it.

I shall not detail the peculiarities of the systems erected by these pioneers of reform; it is sufficient to state, that, through their instrumentality, a new way was opened, and many of the impediments removed, and that they were closely followed by others, whose progress has been still greater from the facilities thus afforded, at the head of whom is to be placed the illustrious Sweedish Naturalist, Linnæus, whose profound research and ingenuity will ever entitle him to admiration. The appearance of Linnæus in the domain of Natural History, produced enthusiastic confidence; it created an era in the annals of Botany, which henceforward was destined to assume a position among other positive sciences. Much as the study of the Materia Medica has been promoted by the introduction of the arrangement of this great man, founded upon the sexual organs of plants, it has been equally benefited by the subsequent method of Jussieu, which, from the extension given to it by Decandolle, allows of grouping all vegetables, allied in constitution, habit, and products. The first is known as the *artificial*, the second as the *natural* arrangement. To the latter I shall direct your attention at present.

The primary division of plants is into two classes, *Vascular* and *Cellular*, or those which possess cotyledons, and those which are destitute of them. The first are distinguished by the possession of perfect organs of reproduction or flowers, and, consequently, seed; the second are flowerless, and produce sporæ. Vascular plants are subdivided into *dicotyledonous* and *monocotyledonous;* the former are necessarily composed of cellular tissue, bark, wood, and medulla; the latter consist of cellular tissue, in which the vascular tissue is fixed in bundles, without any distinction of bark, wood, or pith. These characters are not arbitrary and forced; they are of constant occurrence; the existence of one of them is accompanied by that of all the others. Now, before proceeding further in an enumeration of these seemingly uninteresting details, let us see of how much value those already noticed can be to us. You have been told that the *Vascular* or *cotyledonous* plants bore flowers, and were perfect in their organization; these, then, besides pleasing the eye by their elegance and splendour, are also the sources from which are derived luxuriant edible fruit, of so much consequence to our comfort. In contradistinction, the *Cellular*, or *acotyledonous* plants bear no flowers, and are, therefore, imperfect; to these belong the fungi, mosses, and ferns, which are of little value, and afford but few articles as medicines. You have also been informed that the vascular plants were dicotyledonous or monocotyledonous; to the first belong such as contain all the elementary vegetable substances, except gluten; from them are obtained the most elaborate products of vegetation, as the fixed and volatile oils, acids, camphor, the resins, &c. To the second appertain those which abound in fecula, and whose epidermis contains a large amount of silex; generally, their fruit is devoid of fixed oil, for which, apparently, gluten is substituted; by them the most wholesome nutriment is afforded, and for this purpose many of them are cultivated; such are the various species of grain, arrow-root, sago, &c.

But to reduce our classification to *orders*. It is here that the beauty and utility of the system, founded upon affinities, display themselves. For the purpose of illustration, I shall select such facts as will readily strike your comprehension, presented by the very natural order or family *Cruciferæ*. The flowers, and mode of producing the seed, in the individuals composing this family, are similar, so as to render them distinguishable at a glance; they universally possess stimulating, pungent, and acrid properties, which appertain to a volatile substance; they contain a large proportion of azote; hence their purgency has been attributed to ammonia. The putrefaction of cruciferous plants is attended with a peculiar exhalation, resembling that from animal matter; and the facility with which they undergo decomposition, is a further evidence of an analogy, which arises from the presence of azote in both. From their stimulating qualities they can be rendered valuable auxiliaries in medicine, and mustard may be cited as an instance. We are familiar with cabbage, turnip, horse-radish, and the different species of cress, which are eminently anti-scorbutic, and from the combination of mucilage and saccharine principle, are exceedingly nutritious.

The order *Rosaceæ*, which corresponds to the class *Icosandria*, of Linnæus, is characterized by the astringency pervading the several parts of the plants belonging to it; they owe this to the existence of *tannin;* as types, we may refer to the species of Rubus and Potentilla. Those which produce fruit, afford such as is most grateful to the palate,—as the apple, pear, strawberry, and raspberry,—the flavour of which is attributable to malic acid. Those which belong to the *Amygdaleæ*, or almond tribe, as the peach, plumb, cherry, &c., contain the element of prussic acid, *amygdalin*, which when existing in quantity renders them deleterious; but from the small amount usually present, renders the flavour agreeable.

I might, in this cursory manner, go through the whole catalogue of orders, but this is unnecessary, inasmuch as what has been adduced is sufficient to give an idea of affinities, and to support us in maintaining the advantage which accrues from tracing them. It cannot be withheld, however, that many difficulties and objections lie in the way of the extension of this method, and of its applicability to practical purposes; exceptions occasionally arise to startle the too enthusiastic believer in an exclusive system, and his faith in the stability of analogous characteristics is so weakened, as to induce him to deny that they are worthy of any attention. It is therefore important to examine these opposing facts, and I shall first notice such as are met with in the order *Umbelliferæ*. The plants belonging to this order are exactly similar in

structure, and for the most part possess analogous properties, which differ nevertheless in the different parts. Thus the seeds are stimulating and aromatic, while the herbaceous portions are usually poisonous, and always to be suspected; the viscid concrete juices of a number of them possess anti-spasmodic properties, as assafœtida, gum ammoniac, and galbanum. But from no other order could be selected individuals having more opposite characters; for example, the several species of Cicuta are highly deleterious and narcotic, while the cellery, the parsnip, and carrot are esculent. To reconcile these apparent discrepancies, we must take into consideration the effects of cultivation, soil, climate, and other physical local causes, which modify and destroy unwholesome qualities. The vegetables mentioned are in their wild condition far from being what they are when used as articles of food. None among the plants belonging to this family exhibit a capability of change more than *Conium maculatum*, or hemlock. If reared in a mild southern climate, it retains all the virulence for which it is remarkable, but if transplanted to one less genial, it loses this property and becomes inactive. It is stated that in the Crimea, even this plant is used by the peasants as food.

The order *Solaneæ* embraces also a variety of plants, which are manifestly opposite in properties. From the potato, tomato, and egg plant are obtained nutriment; the capsicum possesses a stimulating principle; and the dulcamara, nightshade, and henbane are highly narcotic. To all of them belong disagreeable qualities, rendering most of those which are esculent unfit for use without preparation, and with regard to the degree or amount in which these qualities exist, as in the previous family, the same effect of modifying and destroying them is produced by tillage.

The occurrence of many irreconcileable facts, moreover, is to be attributed to the want of knowledge, which may, at some future period, be satisfactorily settled. Admitting, then, that this system is not perfect, of what advantage can it be to the Materia Medica, to prosecute the study of it? In reply, I assert, that sufficient is known and determined to afford immense facilities in methodising researches and rendering them practical, and the very obstacles themselves are useful by awakening our energies to the endeavour to trace out the causes of disagreement. Yet it may be supposed, that the advantages of Botany are remote, and that it exercises no especial influence upon the Materia Medica; a few words will suffice to determine this point, and to show to what extent the science is immediately serviceable, and why some degree of acquaintance with it should be possessed. The substitution of the simple and chaste nomenclature of Botany, where vegetable productions are concerned, for the obscure and perplexing names formerly used, is among the greatest improvements of which our latest standard authorities can boast, and for this our own classical Pharmacopœia is most distinguished; besides, the language of Botany has been introduced into every work upon the Materia Medica, and the pages of the text books from which rudimental instruction is derived, are replete with its descriptions, without possessing the key to which, they must remain as sealed and unintelligible as the Sybiline leaves, or an hieroglyphical inscription.

Again, we have daily presented to our inspection, as medicinal substances, roots, leaves, seeds, &c., and is it not of importance to discriminate between them? To identify them? To detect adulterations of them? To ascertain whether the introduced matters are innocent or the reverse, and thereby preserve our reputation from injury occasioned by the unfortunate results of their administration? And who will be best qualified to accomplish all this, except he who understands the sources from which medicines are procured, and the discriminating peculiarities by which they are known? Will he who is skilled in botanical characters be at a loss to determine the place of each, when he has before him seeds appertaining to two distinct families?

The substitution of one article for another, and the introduction of new medicines will be materially aided by the same information. We are constantly in the habit of acting upon the principles which have been but partially presented to you; then, why not render them more efficient by more thorough acquaintance with them?

From the animal kingdom are derived a number of articles which are highly useful in medicine. Animals are ranged under four heads, viz. *Vertebral*, *Moluscous*, *Articulated*, and *Zoophites*. The vertebral are most perfect and include such as are the conspicuous inhabitants of earth, air, and water; they are subdivided into *Viviparous* and *Oviparous*. At the head of the first is man; to this division belong also the whale yielding spermaceti, the musk deer, and castor; within the latter are found the species of sturgeon, which furnish Icthycolla, the species of birds of which the eggs are in use, and several kinds of reptiles formerly in vogue. To the Moluscous family appertain *Sepia officinalis*, and the oyster from which is made the *Testa præparata* of the Pharmacopœia.

Among articulated animals are placed leeches, which, although not included in the Materia Medica, are indispensable to the physician. One of the divisions, the Crustaceæ, derives its name from the hard resisting case covering the animals; it is composed of phosphate of lime. Another division of this family is appropriated to Insects: this is worthy of consideration; here the blistering fly and its varieties, cochineal, honey, and wax, attract our notice.

Zoophites are of little consequence; as examples of their productions, sponge and coral may be mentioned.

To the mineral kingdom we are indebted for some of the most energetic medicines; but the details to be presented are so intimately connected with chemistry and physics, as to render it difficult to separate them; the best plan, perhaps, is to consider them conjointly. Our whole

knowledge of mineral substances, as, for instance, metals and earths, is based upon their chemical attributes, and physical characters, and from them are deduced their affinities. These two maintain a certain relation to each other: thus, when substances of this denomination are subjected to the operation of the laws of Chemistry, and undergo consequent changes, these are attended with alteration in their physical properties. Hence, both must furnish the data upon which to found a classification. To illustrate this, let us take one or two examples. Iron possesses the physical characters of a metal, as it is hard, heavy, malleable, ductile, and shining; Chemistry determines it to be a simple electro-positive substance, and capable of union with oxygen; by this union, its physical peculiarities as a metal are lost, new ones are acquired as an oxide, which can combine with acids and form salts, it is therefore *Basifiable.* Lime possesses the physical properties of an earth; Chemistry shows that it is an alkaline earth; it can be decomposed into a metal (calcium) and oxygen; it is capable of uniting with acids, constituting a base. In the first instance, iron belongs to the class of *electro-positive bodies;* sub-class *Metals;* order *Basifiable;* division, *those forming ordinary oxides.* Lime is ranged under all these heads except the last, as it belongs to the division of *Earths.* Now, *à priori*, would it have been possible to have conjectured that there could be any relation between lime and a metallic body? Yet classification, founded upon chemical analysis, associates it with the oxydized metals.

In addition to the facilities which Chemistry affords to nomenclature and classification, which implies an exact knowledge of the nature of mineral substances and their similitudes, we must regard its utility in another point of view. Familiarity with it obviates the embarrassment which would perpetually occur in the administration of medicines; it would be useless to cite instances corroborative of this assertion; the admixture of conflicting matters would set all rule and precision at defiance, were the ingredients of compounds not carefully selected with reference to their compatability, and the results expected from their exhibition would be defeated. Chemistry, moreover, exercises immense agency in imparting greater efficiency to articles supplied from all the sources that have been adverted to; it produces from those apparently inert others that are highly powerful—it separates active ingredients from matter that is inefficient and useless, and it developes principles which are otherwise hidden from observation. By the isolation of such principles and fitting them for practical purposes. Chemistry has benefited mankind more than all the branches of science contributing to the Materia Medica combined; and the daily announcement of its inexhaustible resources, exhibits ample evidence of the indefatigable industry of those individuals who are labouring to complete its triumphs. To us it is all important; the attention cannot be directed to any quarter where proof does not exist of its utility. It is the touchstone by which fraud is discoverable, and the sure safeguard against dishonesty.

Before dismissing the subject of the means of obtaining a knowledge of medicines, let me notice more particularly that founded upon their sensible qualities. These to a certain extent will serve us, if the articles submitted to this test be familiar, and essentially differ in the impression made upon the senses. But all sensible qualities are fallacious, inasmuch as they have their existence in organs which vary in nicety of discrimination, and for which no standard can be determined. The impression on the sight, taste, touch, and smell differs in each individual; consequently no language can express the infinite shades of disparity; and further, there are substances which are so analogous in sensible properties, that the greatest accuracy cannot detect a difference, yet they may be so opposite in their effects upon the animal economy, as to render a substitution of one for another extremely serious in its consequences; as instances, the several vegetable alkaloids may be cited. Should the resort of chemical reagents fail, I am acquainted with no method of discrimination. Perhaps the impetus that has been given to researches into the form, the magnitude, and the arrangement of particles, may afford the means of clearly demonstrating what hitherto has resisted the best directed efforts.

I have now passed in review the several departments of science from which are furnished the elements of Pharmacology; they are mutually allied and connected together, supported and sustained by the influence that one has upon the other, they present a whole of firm and durable materials unaffected by the fluctuation of opinion. New investigations and more enlarged experience will continue to consolidate them.

Finally, to complete the account of simple drugs, it is essential to indicate the localities whence they are procured, to give their commercial history, as well as the modes of collection and preparation for the market. Under these heads are included a number of circumstances which are interesting and important, and which will be detailed when the different substances become especial objects of attention.

Of the Experimental Method in Physiology—Of the Sensitive and Motor Nerves, and the Ideas of Sir C. Bell. (*Discourse delivered at the Academy, by Professor* GERDY,* *during the seance of 16th April.*)

[Translated for the Medical Examiner, from L'Expérience, Journal de Médecine et de Chirurgie.]

I regret to find myself still disagreeing with colleagues so distinguished as my honourable opponents. But having been myself seriously engaged for fifteen or twenty years in researches in phy-

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*This discourse has been taken down with the greatest care, during the sitting of 16th April, written out under the eyes of M. Gerdy, and revised by him. These, then, are his opinions, which we here reproduce in all their integrity.

siology, I ought to be expected to make in it a certain number of new observations, and arrive by my own experience, at definite ideas of the relative value of the different methods of study proper to an advancement of the science. You already foresee that if I do not look upon vivisections as the only good method, it is because I have received very great advantages from another, and have been deceived in my hopes with regard to vivisections. Well, gentlemen, this is precisely what has happened. On the one hand, in my courses on experimental physiology, having several times announced the results, I have sometimes had the displeasure (and shall I say, the shame?) to see happen, precisely the reverse of what I had predicted; at other times the results were so obscure, that it was impossible to find in them the proof that I sought, and which was promised. These public failures, and many others which I experienced in my private researches, are the circumstances which have shaken my faith in the power of vivisections. On the other hand, I have experienced such great advantages from other methods of studying physiology, or, if you please, from a *complex*, *analytical*, and *logical* method, to which I owe so large a number of new observations, that I ought to grant it great confidence and esteem, and much more than they do to it in the experimental school.

Consequently, after having fixed your attention on the functions and faculties of the nerves, I shall entertain you, very rapidly, if you will indulge me, with the success of the complex method of which I come to speak.

But, beforehand, I desire to reply to the objections of my honourable colleague, M. Rochoux, whilst they are yet recent, and to pay to MM. Blandin and Bouillaud a small arrear which I owe them. M. Rochoux has so early set out with such elevated philosophical considerations, that it was very difficult for him not to descend, in proceeding in the discussion. This is what has happened, and he has not thereby become more positive.

In order to justify the system of Sir C. Bell, he has fortified himself with the experiments of which M. Nonat spoke at one of the last sittings. Finding the results of the section of nervous roots upon dogs and rabbits a little obscure, this young physician has practised them on frogs, and he pretends that the results are more evident. How can M. Rochoux invoke similar experiments! What! the inferior animals, like insects, offer such great differences in the functions and properties of the nervous system, that decapitation does not hinder them from walking, running, and sometimes even from flying; salamanders and turtles live whole months with their natural sensibility and agility, notwithstanding the removal of almost the whole head; and do you think it possible to apply, with certainty, to man, experimental observations made on animals, which are so distant from him in their organization and faculties! Besides, do you not perceive that the experiments which you cite with so much confidence, turn against you? In short, if the experiments of M. Magendie on the section of nervous roots, upon the dog and the rabbit, prove the doctrine of Sir C. Bell, why seek among frogs, proofs which lose as much more of their weight, as these animals are lower in the zoological scale?

According to M. Rochoux, the experimental method is the only one which can in the sciences lead to certain results, for it is founded on *experience*, and he brings forward his knowledge of the observations furnished by time; in short, in accordance with the opinion of M. Rochoux, the concessions which I have made with regard to it are insufficient.

Our colleague here plays upon words; he confounds voluntarily *experience*, which is the science of the past, the science of that which we have seen, with *experiment*, which is an operation by which we force nature to speak when we are ready to hear her. Have I not already explained myself several times on this subject? Have I not said that to *observe* is to listen to nature when she herself spontaneously speaks; that to *experiment*, is to listen to her responses when she has been interrogated; and that if by *experience* we understand all knowledge acquired by simple observation, and by experimental observation, it is not what we generally understand by the experimental method? Have I not already remarked, that we should not confound observers in medicine, properly so called, with experimenters? Have I not said here several times, that what I particularly condemn in the experimental method in physiology, is the unlimited confidence and superiority which it grants to vivisections, over other methods of study? Why, then, equivocate in terms, to invest one with paradoxical opinions, and give himself an appearance of reason? I have made no concessions, nor have I any to make; and, in proof of it, all the observations which I shall make to-day, were expressed by me in 1821, in the Supplementary Journal of Medical Sciences, and in 1831, in the Introduction to my Physiology.

Let us pass, then, to the objections of M. Blandin.

"The roots of the spinal nerves are," says he, "proportioned in their volume to the sensibility and movements of the parts, to which they are distributed." But this proposition, generalized into a law, supposes observations made on a great number of animals; and, if I mistake not, M. Blandin has, with a few exceptions, spoken only of those observations made on dogs. This assertion yet implies that we know perfectly well the sensibility and the movements of the different parts to which the nerves distribute themselves. Now, it is precisely the contrary which is true, for we know nothing positive in this respect, and it would even be very difficult to arrive at anything very certain.

The aid of comparative anatomy and physiology has too often been improperly invoked, to illustrate the faculties and the ill-understood functions of the human species. They do not observe that zoological differences, that is to say, differences

of organization among animals, necessarily involve differences of faculties and functions. For instance, because it has been demonstrated by M. Edwards that the skin subserves much to respiration with the frog, does it prove that it should do so with us? Because we smell by the nose, does it prove that fishes do the same? If they recognise odours by the aid of their nostrils, it is assuredly by another mechanism that we recognise them. With us, odours make no impression, if we do not breathe through the nose. Plunged in a scented atmosphere, we perceive the odour, when in respiring the air passes through the nostrils. Well, the nostrils of fishes forming two cavities which neither open into the mouth nor into the fauces, but two blind cavities or culs-de-sac, the water does not traverse them during the respiration of the animal.

Lastly, a well-known fact will render my position still more evident. Many authors have asserted that the external ear serves to collect sounds, and to augment their action on the auditory nerve; and they adduce, to prove it, the perfect acoustic trumpets formed by the ear of the horse, of the ass, and of other animals. We now know very positively that the external ear favours audition very little, and that it is not in collecting sounds which assist it. The experiments of M. Lavart have shown that it is by other mechanism.

According to M. Blandin, there is not only an analogy, but a similitude, (that is to say, more than an analogy,) between the nerve of the fifth pair and the vertebral nerves; for the trigeminus has two orders of roots, and that of sensation has a ganglion, as is observed in the spinal nerves. This is what M. Blandin quotes from Sir C. Bell, who found it necessary to establish these analogies for his system. But Gali, who also had a system to establish on the origin of the nerves, has seen these things in a different light.

In reality, gentlemen, see what wide differences exist between the trigeminus and the spinal nerves! The latter have anterior and posterior roots, the trigeminus has them superficial and deep; the anterior roots of the spinal nerves end in the anterior column, and the posterior ones in the posterior column, without our being able to detect their disappearance in the spinal marrow; the superficial roots of the trigeminus, which, for the most part, make the fasciculus called muscular, do not come from the spinal marrow. They form one or more fasciculi, which, leaving the nerve which they help to compose, lose themselves at the surface of the pons varolii, above, below, or within the middle of the crus cerebelli, and disappear sooner or later in different subjects. The deep ones bury themselves among the transverse and longitudinal fibres of the pons in the cineritious and reddish-gray substance which is there observed, and make up at least two large roots—one transverse, the other vertical. The first comes from the inferior extremity of the aqueduct of Sylvius, from the cineritious substance which covers it, in such a manner that it is connected with its corresponding nerve of the opposite side, by this gray matter. The deep vertical root is traced below into the thickness of the restiform body, or between this and the corpus olivare. Now, since the corpus restiforme is the termination of the posterior column of the medulla, the trigeminus has connection with only one of the columns, and it still has other connections with the tissues and adjacent organs which the pons offers in its organization, compared with that of the spinal marrow.

It follows from this arrangement that the fifth pair has an evident connection with the spinal cord only by its deep root, which is traced into the posterior column; that it is not manifestly continuous with the anterior columns, or with the fibres of the corpora pyramidalia; that it only approaches and is contiguous in passing by their side; that, besides, the superficial roots lose themselves immediately at the surface, or in the superficial transverse fibres of the pons varolii, which go to the cerebellum; that the deep roots have particular connections with the peculiar tissues of the protuberance, which we cannot trace into the medulla oblongata; that if, as Sir C. Bell wishes, and as it is reasonable enough to suppose, that the nerves derive their functions from the connections of their origin, it is impossible that the trigeminus and the spinal nerves should have the same functions, since their origins are certainly different. Think not, gentlemen, that the observations with which I shall detain you, are suppositions; I have brought with me specimens which demonstrate the arrangement I shall describe, and we find in many authors passages which justify my observations. Thus, Gall, who has traced the deep roots of the fifth pair, describes them as coming from the cineritious substance at the floor of the fourth ventricle, by several divisions. M. H. Cloquet has described, in an analogous manner, the same origin. Rolando has seen and figured several varieties of the superficial roots. Meckel counts three roots of the fifth pair, a large, deep, and two lesser ones. M. Cruveilhier makes two—one superficial, which is soon lost, and another profound.

Besides, no one before Sir C. Bell had perceived in the trigeminus the two orders of roots, which we can there see to this day through the prism of the system, although we may have discovered nothing new. You now see, gentlemen, whether it is true that the fifth pair resembles the spinal nerves.

I come to the objections of M. Bouillaud——but I do not perceive him at his place. Being present, I would have answered him; absent, I will not make a reply which he cannot hear. I pass, then, to an examination of the properties of the nerves.

I have already shown how the system of the sensitive and motor nerves, which appears to go back to the school of Alexandria, was developed by Galen, and taught even to the seventeenth century by Dulaurens in his Anatomy; how it was supposed by the ancients to explain the paralysis of sensibility and movement, when

isolated or separated from each other; and how Sir C. Bell has revived it for the same end. But I am ready to grant that he has given it an entirely new basis, and that he has made it so brilliant and seductive, that we regret in truth, that he has not been called to the counsels of the Creator.

It is not that this system is false in all its details; on the contrary, we find in it dazzling truths, which reflect great honour on Sir Charles Bell. But what does this prove for the truth of the whole? What system is there that does not contain truths, and even remarkable truths? Were it a single one, it would entice no one, nor would it endure for a day, or rather, it would never become established. Do not wonder, then, that that of Sir Charles Bell has attracted the admiration of my honourable opponents! neither wonder if I combat it as a whole, every where recognising in its details extremely remarkable truths. Be persuaded that my antagonists themselves think in part with me; it is in vain they exalt the system, and declare themselves its defenders; they adopt only that which suits them, and there are not more zealous sectarists than those who think themselves Christians because they go to mass once a year.

To judge of the system, we must then penetrate absolutely into its details. According to Sir Charles Bell, the spinal marrow is composed of three columns or bandelettes on each side of the mesian line, an anterior column destined to motion, a posterior column for sensation, a lateral and intermediate one for the involuntary movements of respiration, etc. The nerves are simple or compound: the simple are those whose roots arise from one and the same part, and have but one property; the compound, those which come from different parts, as from the anterior and posterior columns of the spinal marrow, and have several distinct properties. Consequently, the olfactory, the optic, are simple nerves, and they are endowed with a specific sensibility. Observe, however, that the olfactory arises from three very different parts, by three very dissimilar roots, each of which, besides, does not touch the spinal cord, for the corpus callosum bends itself from above downwards between the roots of this nerve, to embrace within its concavity the superior extremities of the diverging fibres of the corpora striata, as I have demonstrated in my researches on the brain.

As to the optic nerve, it arises by two roots at least, from two parts still very different: the optic couches and tubercula quadrigemina, which have properties very distinct, with the consent of all experimenters. This nerve, so simple from its known properties, is not then so simple from its connections.

The motores oculorum, which all allow to be nerves of motion, do not take their origin precisely from the anterior column of the medulla oblongata, or from the corpora pyramidalia prolonged into the crura cerebri; but principally from a gray matter, and a peculiar yellow substance, which is there found more deeply situated. I have here an old diagram of this description, which I made many years ago, whilst I was engaged in anatomical researches on the nervous system. The drawing not having been made for the occasion, as the antiquity of the paper and the other designs accompanying it will testify, you will not suspect my veracity in this respect. The origin of the third pair of nerves is, then, very different from those roots of the spinal nerves called motor.

The pathetic is, according to Bell, an involuntary muscular nerve, which should come from the lateral column, but which, in truth, comes from the prolongations of the cerebellum into the tubercula quadrigemina and the valve of Vieussiens.

I have not again to point out to you the inaccuracy of the system, or the origin of the fifth pair. It is a task which I have accomplished, in answering the objections of my worthy colleague, M. Blandin. I will not even continue this critical review, through fear of fatiguing the Academy by too many anatomical details. Besides, it suffices, imperfect as it is, to show how a systematic writer bends facts to suit the frame in which he wishes to place them, and how, moreover, it is as much easier for him to find an ideal, in the place of real nature, as he has more intelligence and genius.

My opponents and myself have so often spoken of the experiments of Bell on the fifth pair and the facial nerve, that I will not revert to them. I will merely remark to M. Blandin, that since he supposes that the facial nerve is sensitive at its emergence from the stylo-mastoid foramen, it does not suffice to affirm that it owes its sensibility to other nerves, which join themselves to it in the aqueduct of Fallopius; it must be demonstrated. Until then, his assertion will be only an hypothesis.

It is true, that my antagonists still argue, that as the section of the fifth pair upon the petrous bones paralyzes all the face, and the little sensibility which the facial possesses, it is necessary to conclude that it is not sensitive in itself. Granting this fact to be correct, for which I do not answer, I will say, every one knows that the olfactory, the optic, and auditory nerves, serve for smell, sight, and hearing. If, notwithstanding, the section of the fifth pair on the petrous bone causes the loss of smell, of sight, and of hearing, as M. Magendie teaches, does it prove that these nerves do not serve for smell, sight, and hearing? Does not this fact prove, on the contrary, that the trifacial is only a condition necessary to the functions of these nerves? If, then, the section of the same nerve paralyzes also the sensibility of the facial, how would that prove that the facial is not sensitive in itself? Would it not be more probable that its integrity would be necessary to the sensibility of the facial, as it is to the sensibility of the olfactory, optic, and auditory nerves?

Not being able to examine the system of Charles Bell in all its details, I pass now to the labours of M. Magendie, and shall show you how my opponents, who believe at once in the doctrine of the English physiologist, and in the results obtained by the French physiologist, believe at the same time in two contradictory doctrines. They

may, perhaps, with our worthy colleague, M. Bouillaud, reproach me for arraying facts in *civil war, whilst they endeavour, by all their efforts, to reconcile them for the interest of science.* Ah, sirs! does not this frank avowal sufficiently clearly unveil to you that unhappy systematic spirit, against which I have just inveighed? What! shall we have in science, as in politics, ministers of reconciliation! In the sciences, gentlemen, assertions are true or false, and truth does not lay between, and we make not truth by mingling the true and the false! But let us prove, by some examples, how far the experiments of M. Magendie are sometimes contrary to the ideas of Charles Bell. Whilst the latter sees in the fifth pair only, a nerve of motion and sensation, the former shows that its section on the petrous bone, exercises an immense influence on the senses already pointed out above, and without which the functions of smell, sight, and hearing, could not be fulfilled; without which, even the eye cannot preserve its natural integrity, but becoming inflamed, ulcerates, and permits the discharge of the humours. Who would have been able to predict such results? No one. Sir C. Bell, also, whose doctrine is but a system, has not suspected it; he has seen there only a spinal nerve. But will they say, that if MM. Bell and Magendie are not agreed upon the functions of the trifacial, they are upon those of the roots of the spinal nerves. This is nearer the truth, but can this well hold when there has been a common interest in the question. Sir C. Bell having imagined that the spinal nerves ought to receive different properties from each of the two orders of the irroots, bethought himself to irritate, separately, the anterior and posterior roots on a rabbit, to which he assumes not to have caused suffering. Having seen that an irritation of the posterior roots caused no movement in the muscles, whilst that of the anterior did, he concludes from this, on the difference in their functions. But he went no further. M. Magendie, struck with the want of precision in the results of Sir Charles Bell, launched into this new field of experiment, which opened itself before him, and with that ability which characterizes him, lending the aid of his hands to the adventurous conceptions of the London physiologist, he became the arm of the system of which Sir Charles Bell was the head. Behold how, beyond doubt, the interest of that which they regard as their common glory, holds them united and agreed.

It would occupy too much time to relate, in detail, all the discrepancies which exist between the preceding authors, Herbert Mayor, M. Fora, Bellingeri, M. Calmeil, and, among others, myself, who have all repeated and varied the greater portion of the experiments made on the nervous system, to find out their properties.

After having shown, at large, how little agreement there is between the results obtained by different experimenters, let us see if those which pathology furnishes are more favourable to the new doctrine.

The study of diseases shows that the distension and compression of the medulla spinalis, abolishes the manifestation of sensibility and voluntary contractibility of the parts which receive their nerves from a point of the spinal marrow, situated below the lesion, and which I shall call the parts inferior to the lesion. It shows that the disorganization, and especially a solution of continuity of the spinal marrow, abolishes, *ordinarily*, the manifestation of sensibility and of movement in the parts inferior to the lesion. It teaches us that paralysis shows itself generally on the injured side of the spinal cord; that paralysis of sensibility and motion can happen separately or together, without any materially appreciable lesion. These assertions have no need of proof, since their truth is generally, and well known. It is not the case with the following: I shall therefore be obliged to adduce proofs suited to the support of each.

Sometimes the paralysis manifests itself above a material lesion of the medulla spinalis. Thus—1. Portal reports to have seen the paralysis of the left arm, and at death a softening, with redness, existing only on the right inferior extremity of the cord, from the last dorsal to the first lumbar vertebræ.

2. A young soldier, who died with universal paralysis, presented only a softening at the lower portion of the cord.

In certain cases, the lesions of the spinal marrow cause only a paralysis of motion, whatever may be their seat around the axis of the cord.

3. Preval, who remained in bed during seven years, with the arms and legs flexed and contracted, and which he at times moved voluntarily, presented, at his autopsy, a softening of the anterior columns of the cord, in almost their whole thickness, in their entire length, even to the cerebrum. Why were not the superior extremities, as well as the lower, paralysed, since the alterations of the cord were the same above and below?

4. Elie had a paralysis of motion in his inferior extremities, *only*, after a fall from a third story. According to the new ideas, you would have expected to find, at his death, an alteration of the anterior columns of the cord. A mistake: the spinal marrow was equally softened, both before and behind, on a level with the twelfth dorsal vertebræ.

5. A water-carrier, injured in the back, experienced a complete paralysis of motion in the inferior extremities. and an incomplete paralysis of sensibility. You would diagnosticate, a serious lesion of the anterior columns of the cords below, and a slight alteration of the posterior columns. Still a mistake: the spinal cord was crushed and softened in its whole thickness, and for the extent of an inch opposite the twelfth dorsal vertebra.

6. Mettral died with a complete paralysis of motion in the inferior extremities, and incomplete in the superior. A zealous adherent to the system is not embarrassed; he pronounces boldly: alterations of anterior columns low down the cord, slight in the cervical region; then comes

in its turn the autopsy, which shows a semi-fluid softening of the entire lumbar enlargement, although there was no paralysis of sensibility below, and, in short, an induration of the entire cord from the eighth dorsal vertebra to the crura cerebri. How happens it that there was not at last a slight paralysis of the superior members, as well as any thing else?

7. A child of 7 years died with the signs of a chronic arachnitis, and there were found encephaloid masses in the inferior and posterior part of the cerebellum which compressed the cord above and behind. The restiforme and olivary bodies were altered and reduced in encephaloid matter. There was no paralysis of any sort; not the slightest trouble in comparison with a lesion so grave as that of the cerebellum! What disobedience to the laws so often proclaimed here by M. Bouillaud! What impudence on the part of this child.

Why was the sensibility alone preserved in the 4th, 5th, 6th, and 7th cases of which I have spoken? Is it that generally it is less easily paralysed than motility? It is at least what I have gathered from the mass of observations which I have united and reflected on.

But pathology shows still more astonishing discrepancies than those with which I have occupied your attention. 8. Petitpas died with a strangulation of the spinal cord, caused by enlargement of the posterior portion of the second vertebra, with the first softening without disorganization, situated behind the cord; with a second softening of an analogous kind extending from the sixth cervical to the second dorsal vertebra; lastly, with a third softening extending from the seventh dorsal vertebra to the lumbar enlargement, and reduced into a semi-fluid subtance below. These were the lesions: I defy all physiologists and pathologists to indicate now the attending phenomena which were the consequences of them. Here they are: the neck and the chest were benumbed to the third rib, from above downwards; the superior extremities, and the trunk, from below upwards to the epigastrium, were also benumbed, and were incessantly tormented by intolerable itchings. Between the third and seventh ribs, the sensibility was undiminished around the chest. Why were the upper lesions of the cord sufficient to alter the sensibility of the superior parts, and were not sufficient to alter that of the parts placed below, between the third and seventh ribs?

9. Delafoix died with a cerebro-spinal congestion, with remarkable softening of the cervical enlargement for the extent of two inches, particularly of the gray substance. These lesions being given, who would venture to guess the symptoms which were the consequence of them? He had paralysis of the superior extremities, and why not of the inferior?

10. Dufont died with softening and disorganization of the spinal marrow, on a level with the processus dentata, which was moveable; with a rupture of the medulla oblongata, probably made after death; a rupture of the motor externus, pneumo-gastric, and glosso-pharyngeal nerves, with alteration of the facial, auditory, and hypoglossal nerves. He who would venture to guess the symptoms produced by these lesions, would be quite sure to be deceived! There were severe, superficial, and deep-seated pains in the neck, twelve hours only before death; imperfect paralysis of the muscles which elevate the lower jaw; and lastly, prostration, or a sort of general paralysis.

11. M. L—— died with a paralysis of motion of the superior extremities, but without any paralysis of the inferior. What would you assign as the lesions of the cord? It was liquid, fluctuating in a membranaceous tube between the fourth cervical and the fourth dorsal vertebra. It presented on the left, for half an inch in extent, lenticular portions, and a bandelette, altered for two lines in breadth, which appeared to M. Magendie so incapable of transmitting sensations and volition, that he asked whether the membranes of the spinal cord might not be the agents of this transmission.

Lastly. Pathology sometimes shows sensation and motion preserved in parts entirely cut off from the brain, in consequence of the absence, destruction, and solution of continuity of the spinal marrow in its whole thickness. You ought, gentlemen, to be prepared for this proposition by the facts cited above, and particularly by the eleventh.

12. Famel showed, in 1711, at the Académie des Sciences, an infant at term, without cerebrum, cerebellum, or spinal marrow, who lived two hours, and felt the baptismal water at the moment that it was christened. (And how do you know it? cried a member of the Academy.) As one knows that a leech feels the pepper that is thrown on its tail, when we see it agitated and doubling itself on itself. For every movement consequent upon a touch is not a communicated or a mechanical movement; it is the result of an impression, and, consequently, of a sensation. Thus, when we touch an actinite spread out in the waters of the sea, and which closes itself suddenly—when we touch a polypus, and it moves—when we prick the sensitive plant, without shaking it, or when we cauterize it with an acid, its leaflets, its leaves, its branches even, close themselves, every one says that these beings feel, and that they have sensibility, because they have expressed it by their movements. It is thus by its movements that the child in question evinced that it had felt. And why should it not execute movements, when an acephalous fœtus executes them in its mother's womb,—when a fly flies with its head cut off,—when a salamander swims, deprived almost entirely of the encephalon and of the head,—when a duck runs several steps, its head being taken off?

13. Mery saw, in 1712, an infant, who lived twenty-one hours, and took some nourishment, although he had neither brain nor spinal marrow. As he took the nourishment, he must have felt the need of it,—and as he accepted it, he must have felt that it was presented to him, and have

made movements necessary to seize and swallow it.

14. Rippert, a Marseillais, wounded on 10th August by a ball which passed through the lungs and the tenth dorsal vertebræ, urinated, moved the pelvis without convulsions, and the inferior extremities, until his death. At his autopsy, the spinal marrow was found cut across between the tenth and eleventh dorsal vertebræ. Desault perceived so well the extraordinary nature of this fact, that the pupil who reported the observation over his name in his journal, presents it as a case which subverts all received ideas. Thus has it been examined with the greatest attention by a man eminently capable of properly observing a fact of this nature.

15. In 1820, a scrofulous child died without any paralysis, either of sensation or motion, and notwithstanding the autopsy showed a complete interruption of the spinal marrow from the ninth dorsal to the first lumbar vertebra.

16. Chardonnens died with an equally inappreciable lesion, and yet the inferior half of the lumbar enlargement was found softened and destroyed, even to three or four lines above the section. The greater part of the nerves of the pelvic extremities were detached from their origin, and the others adhered only by the dura mater.

17. A man of 30 years died without any evident paralysis: at the autopsy no trace of the cord from the tenth dorsal vertebra to its lower extremity; its substance was different, nervous trunks visible only in the foramina of their junction.

18. A man named Dubois died in 8 days of a grave fever, with cramps in his legs, and after having gotten up, himself, to go to stool, a few hours before his death. At the autopsy, the spinal cord was interrupted for the extent of an inch and a half, about the sixth dorsal vertebra, with an intermediate yellowish liquid.

Here are eighteen cases which do not agree, either with the new, or even with our ancient ideas on the functions of the nervous system. But the seven, and I might say the eight last especially, are well calculated to excite astonishment. Moreover, when we bring to mind that the most of these facts, all of the gravest nature, date within late years; that they are becoming more numerous, because now autopsies are made more exact than formerly; that besides, they come to us from well known and estimable authors, for I have selected them with the utmost care, we can scarce refuse to admit that were we oftener to open the vertebral column, we should be in possession of a greater number, and that probably they will multiply themselves still more, in proportion as we shall further study the diseases of the spinal marrow.

FOREIGN SUMMARY.

A Lecture on Rheumatism. By Robert Carswell, M. D.—Gentlemen: I propose to lay before you a summary of the cases of rheumatism at present under my care in the hospital. Some of these have been under treatment for a considerable time, while others have been but recently admitted. In two of the former, the acute general symptoms have disappeared, and the disease presents itself in the chronic form; and in one other of the same class there remain only the local sequelæ of the disease. Of the recent cases I shall notice one only, as a good example of acute rheumatism, in which the local and general symptoms are well marked, although not of great severity, and in which there is also the important complication of a simultaneous affection of the sero-fibrous structure of the heart.

Although the most of you are, no doubt, aware of the several forms under which rheumatism occurs, I shall briefly state the more important of them, as we have examples of each in the cases to which I shall allude.

And, in the first place, rheumatism is divided into *acute* and *chronic*. These two terms, however, express merely a difference in the degree and duration of the disease; the line of demarcation between the two not being always very distinct, inasmuch as the fever and local inflammation are present in both, and vary much in relation to each other in degree, also, in both. With regard to the chronic form of the disease, it may either succeed to the acute, or it may have been so from the commencement. And, again, with regard to the local symptoms which accompany either acute or chronic rheumatism, these may persist after the general symptoms have disappeared in both; that is to say, the local inflammation, particularly of the joints, which occurs in both the acute and chronic forms, may continue for an indefinite period after the febrile state has been removed by proper treatment. And it is to this stage or form of the disease that the appellation of *hot* and *cold* has been applied, which bear the same import as the terms *sthenic* and *asthenic*. The *hot*, or *sthenic* form has also been distinguished by the term *active;* and the cold, or asthenic, by that of arthrodynia.

Lastly, what are called the sequelæ of rheumatism, viz., enlargement, thickening, induration, and other morbid states of the joints, may remain after the local inflammation which had produced them has disappeared, and without being accompanied by any disturbance of the general health. But I need hardly observe that these local morbid conditions can no longer be associated with rheumatism, either as regards their nature or treatment, no more than similar changes occurring in any other part of the body as the consequence of ordinary inflammation, and from which, so far as we know, they differ only in their having, at their commencement, been associated with rheumatic fever. I may also notice here, as a very common effect of rheumatism of the joints, defective muscular power, which is sometimes so great as to prevent entirely the patient from using the affected extremities, even after all pain and swelling have disappeared. This was the case particularly in the hands of one of our patients, Maria List, who could not grasp or support with her fingers and hands,—

although in no way deformed,—the crutches she was recommended to use to assist her in walking.

From these general remarks, the several forms of rheumatism may be enumerated as follow:—1st. Acute rheumatism; 2d. Chronic rheumatism, sub-divided into chronic rheumatism, consisting first, in fever and local inflammation; secondly, in local inflammation without fever: and, 3rd, into the sequelæ of rheumatism, or various morbid states of the joints.

Before alluding to the individual cases, and the treatment of them, I may also notice an affection which, whether existing in an acute or chronic form, has been considered by many physicians of a rheumatic nature, viz., *sciatica*, of which we have now two cases under treatment. That this painful affection is frequently of a rheumatic nature, there hardly can exist a doubt, inasmuch as it is met with accompanying the usual forms of acute or chronic rheumatism; sometimes preceding, at others following an attack of this disease. In other cases, again, it can in no way be associated with rheumatism, but, like rheumatism, is an acute inflammatory disease, requiring the same active antiphlogistic treatment, both local and general, at its commencement, for its cure; and, indeed, morbid anatomy has demonstrated the inflammatory nature of this disease in certain cases, the sheath of the nerve having been found in a state of high inflammatory congestion, and the nerve itself softened or converted into a mere pulp.

The first case, then, which I shall notice, is one of acute rheumatism, occurring in a female, named Mary Bye, in the private ward, twenty-four years of age, stout, and of a sanguineous temperament. The disease made its attack under the ordinary circumstances, or under the influence of the ordinary exciting causes, viz., exposure to wet and cold, as a servant of all-work. It is stated that a fortnight since she first felt some pain in the left foot, which soon after became red and swollen; the pain soon attacked the knee and hips, and subsequently the hand. She has had leeches and fomentations, and taken purgatives.

On her admission.—The right hand is principally affected; the metacarpal joints of the first and second phalanges are highly inflamed and excessively painful, and she cannot open or shut the hand; she describes the pain as gnawing, sometimes darting or shooting. The pain is evidently very much relieved by cold, though very slightly increased by heat. The left ankle and knee are also similarly affected, but in a less degree; considerable pain is felt in them on the slightest motion or pressure. Both knees are swollen from œdema; skin hot and perspiring; face expressive of pain; countenance flushed, and eyes injected; great thirst; furred tongue; no appetite; bowels regular; urine high-coloured and scanty; menstruation performed regularly; pulse 98, full and firm.

Heart.—With the first sound is heard a bellows-sound, louder than that with the second; they are heard most distinctly at the base; rhythm and impulse natural.

Feb. 1. Bleeding to twelve ounces; acetous extract of colchicum, one grain, every night and morning. Low diet.

2. Blood buffed; pain very little less in any part.—Bleeding to 12 ounces.

Calomel, 3 grains;
Comp. ipecac. powder, 5 grains; every night and morning.

5. Blood both buffed and cupped; hand very much better; the elbow and shoulder are now the seats of severe pain. The patient obtains no sleep at night from the pain, which is then much worse than during the day.—Increase the extent of colchicum by half a grain, and the comp. ipec. powder to 10 grains.

6. Passed a sleepless night; very little improvement; gums slightly affected; bellows-sound heard much less, and with the second sound is hardly perceptible.

The most interesting circumstance to be noticed in this case is the occurrence of *endocarditis*, as indicated by the bellows-sound. This anormal sound accompanies both sounds of the heart, and is heard most distinctly at the base of that organ. That it indicates the presence of inflammation of the lining membrane of the valves, and most probably chiefly of the aortic valves, there cannot, I believe, be any doubt. It was heard at the time the patient was admitted, and may have existed for some time before. Although the case is, as I have already said, a good example of acute rheumatism, the symptoms are far from being so severe as they are frequently met with in this disease. Its being complicated with endocarditis is, therefore, the more interesting,—a circumstance, indeed, of very common occurrence, even in the mildest forms of acute rheumatism. Such a complication ought always to be looked for, and the energy and efficacy of the means of treatment regulated and tested by the stethoscopic signs which this, the most dangerous in its future consequences of all the forms of rheumatic inflammation, affords. It is gratifying to observe the favourable change which has already taken place in this case; although the general symptoms have undergone but little amelioration, the intensity of the bellows-sound has considerably diminished; indeed, that which accompanied the first sound is hardly perceptible; and this favourable change has been effected in the space of five days, at the end of which time, also, the constitutional influence of the mercury was manifested by the state of the gums. The result of the case, which must interest you from this circumstance alone, will be announced to you on a future occasion.

Of the two chronic cases to which I have alluded, both of them at the time of admission presented the characters of chronic rheumatism, and that form of the disease termed the asthenic, or cold rheumatism, the joints being the parts affected, the pain being rather relieved than otherwise by heat, and there being little or no febrile excitement.

The first of these patients, Esther Barnes, æt. 26, was admitted the 11th of December. She is of a sanguineous temperament, of regular habits; has lived in a damp situation, and been accustomed to hard work as a servant. She had an attack of acute rheumatism five years ago, in the left knee, which lasted six weeks. Fourteen months ago she had another attack in both knees, which became contracted, and have remained much in the same state ever since. The symptoms at her admission were the following:— Temperature of surface natural; suffers much pain in both knees; great effusion in the joints; pain not increased by heat; is worse when she attempts to move; sleeps badly; respiration and sound of heart natural; tongue clean; bowels regular; urine natural; catamenia regular. On the same day it is afterwards stated that the "rheumatism is relieved by heat."

This, then, is a good example of the cold or asthenic form of chronic rheumatism, marked as well by the duration of the disease as by the relief afforded by the application of heat to the affected parts, and the nearly natural state of all the important functions of the body.

Notwithstanding the length of time which the disease had lasted, and the great enlargement of both knees, rendered it more than likely to be one that would yield but slowly to any mode of treatment, the case has, however, gradually improved; the pain and swelling of the knees have gradually subsided. Indeed there is no pain, unless when the patient moves the limbs, as in walking, which she can now do with greater ease.

The treatment adopted consisted in the internal use of the iodide of potassium, and the repeated application of blisters, sinapisms, and stimulating liniments. She began with ʒss. of the solution of the iodide of potassium, three times a day, which was increased, in the course of three or four weeks, to ℨiv., when it was laid aside. The treatment now consists of local applications alone. The patient has been nearly two months in the hospital.

The next case is that of Anne King, æt. 45, who, about two years ago, after getting wet, had rheumatism in the hands and knees, and since which time she has never been altogether free from it; on the contrary, it has been gradually aggravated during the last eight months. On her admission she presented the following symptoms:—

Skin hot and dry; feet and hands always cold; complains of a gnawing pain in hands and knees, which is less when hot than cold; great pain is produced by pressure; hands are slightly swollen; fingers flexed and not extensible; effusion into the knee-joints, more so in the left; both legs flexed, and incapable of extension; chilblains on the toes of both feet; bowels regular; catamenia ceased a year ago; tongue very white, but moist; great weakness in loins and hips; urine plentiful and high-coloured; pulse 80, and regular.

The treatment in this case was similar to that adopted in the preceding. The iodide of potassium was employed, beginning with ʒss. of the solution three times a day, and gradually increasing the dose. At the end of a fortnight she was taking ʒi. of the solution, and was much improved in all respects.

On the 10th of January the pains became worse, which was attributed to change of the weather, and continued so for a week, when the iodide of potassium was laid aside, and the ammoniated tincture of guaiacum and decoction of bark substituted. This plan of treatment has been continued up to our last visit, together with the local application of stimulating liniments, sinapisms, and occasionally poultices, but with very little improvement. As the patient complains much of weakness and loss of appetite, she has been ordered one grain of the sulphate of cinchonine and one ounce of the infusion of absinthium, three times a day, and to continue unremittingly the external applications.

The third case to which I alluded is that of Maria List, æt. 23, who was admitted more than three months ago, and the history of whose case is rather ambiguous. She complained chiefly of loss of the use of the extremities, from the feet to the knees, and from the hands to the elbows; pain in the lumber region; inability to stand or take a hold of anything. She was bled twice to twelve ounces, within the first four days, and took the colchicum wine during the first week, with relief of the pain. On the 30th, that is two weeks after her admission, she was put upon a course of the iodide of potassium, soon after which the pain disappeared, except in the joints, when extension of them was attempted. Blisters, cataplasms, and stimulating liniments have been applied to the knees; extension of these has been gradually effected; the fingers and hands are regaining their power; and the patient is now able to walk about with the assistance of crutches.

It was to the loss of power and motion in this case, to which I alluded, as a good example of these morbid conditions as the consequences of chronic rheumatism.

The cases which I have now to bring under your notice are two of rheumatic inflammation of the sciatic nerve, or sciatica. They are both very marked cases of the affection, and although the patients have been attacked more than once, they never have had rheumatism of the joints.

The first case is that of James Dalgleish, admitted the 15th of this month. He is a groom, of sanguineous temperament, florid complexion; married; of pretty regular habits; living in London; has always enjoyed very good health. His father died of calculus vesicæ; his mother is still living and healthy.

History.—In August last he was affected with rheumatism, occupying the right leg, and extending from the hip to the ankle. It left him in about four days under the use of spirit. terebinth. as a liniment. He can assign no cause for the attack. He then continued free from it until the 5th December last, when, after having been out all day in a chaise, when the weather

was very cold, he was again attacked with rheumatism in the same limb, and to the same extent, but more severe than before. It now prevented him from walking or sitting, but he was quite easy when lying down. The pain was relieved by warmth; he has derived no benefit from the treatment he has been recommended.

Present symptoms.—He now complains of a dull aching pain as soon as he attempts to stand or sit, which gradually becomes more and more severe, and compels him to lie down, which gives him immediate relief. The pain leaves him entirely when he is in bed, the affected limb only feeling somewhat numb. Warmth relieves the pain, cold increases it. The skin is hot and dry; pulse 80, and full; tongue whitish and slightly furred. A little cough and expectoration for a few minutes at first getting out of bed in the morning; bowels regular; some difficulty experienced in making water when the pain is severe; urine scanty and dark-coloured, and deposits a thick sediment. The joints of the affected limb are not swollen or red.

Jan. 15. *Calomel*, 5 grains;
Compound extract of colocynth, 6 grains.
Make two pills to be taken at bed-time.
A senna draught in the morning.

Venesection to 12 ounces; cupping to 12 ounces over the hip.
Colchicum wine, 20 minims;
Carbonate of magnesia, 1 scruple;
Camphor mixture, 1 ounce. To be taken thrice a day.

19. Blood buffed and cupped; the serum of that taken from the arm was very milky. A great deal of relief has been derived from the cupping; there being now no pain felt except in moving, and is then felt chiefly in the ham-string and muscles.—A blister over the sacrum.

22. Pains rather worse, increased in the morning; bowels regular.—Repeat blister; to be kept open with savine ointment.
Comp. ext. of colocynth, 10 grains;
Calomel, 2 grains. To be taken at bed-time, and repeated if necessary.

26. Pain much less, and only felt when walking, or after standing for some time.

29. Improving; blister allowed to heal on the 25th; is not purged by the colchicum, but the bowels are kept open by the calomel and colocynth pill taken every night.—Increase the colchicum wine to 40 minims.

Jan. 2. For the last three days there has been more pain. There is also some cough, in consequence of the patient having taken cold. The acetous extract was now substituted for the wine of colchicum, a grain of the former being ordered to be taken three times a day. In consequence of the cough, and in order to procure sleep, a pill, composed of five grains of henbane, and ten grains of Dover's powder, was also ordered to be taken at night. Such is the state of this patient's case, and the treatment up to the present time.

The second case is that of John Withers, æt. 40, admitted the 21st of the same month. The patient has had two similar attacks, the first about twenty-two, the second five years ago. The first was the more severe of the two, and continued for two months. The history and symptoms of the present attack are as follow:—Three weeks ago, after having been exposed to cold and wet in the pursuit of his employment, (house-painting,) he felt the rheumatism coming on in his left hip, although slightly; and on the 14th of this month he got wet through, and allowed the clothes to dry on him. The next day he could not move for the pain and stiffness of the joint. He got gradually worse, and was admitted the 21st January.

Present symptoms.—He now complains of most intense pain, extending from the sacrum down to the foot, the hip, knee, and ankle, being most affected. None of these parts are swollen or red, but feel very cold, and the patient has frequent shiverings. There is a continual aching pain in the joints which is relieved by cold and increased by heat. The skin is cool and natural; no perspiration: tongue whitish and moist; appetite very good; bowels rather costive; urine dark, rather scanty, and deposits a sediment.—Cupping over right hip to 10 ounces.
Acetate af colchicum, 1 grain, night and morning. Low diet.

22. Some relief in the hip from the cupping, but the pain still continues in the knee and ankle.
Dover's powder, 10 grains;
Calomel, 2 grains; every night. Continue acetate.

23. Somewhat better; slept for five hours last night, which he had not done for a week before.

26. Hip better, but the pain still continues in the ham and ankle. Ten leeches to the left ham. The Dover's powder to be taken only every other night. Middle diet.

31. The pain has left the hip and ham, but is very severe in the ankle, which is red and swollen.—Eight leeches to the right ankle.

Feb. 2. The pain much the same in the ankle, but has returned to the hip.—Ten leeches to hip; six leeches to right ankle.
Dover's powder, 6 grains;
Calomel, 2 grains; night and morning.

There is nothing requiring particular observation in the history of these two cases of sciatica. The disease is equally well marked in both, but of greater severity in Withers, and occurred in both patients under the influence of the ordinary exciting causes, viz., exposure to cold, or wet and cold. The mode of attack, and the symptoms have been very similar in both. There is, however, mentioned a singular difference in regard to the pain, which, in the first patient, is increased by cold, and relieved by heat; whereas, in the second, it is quite the reverse, the pain being relieved by cold, and increased by heat; and this is the more remarkable as the same nerve is affected, and the character of the pain is the same in both cases. It is a difference which I shall not attempt to explain, and could not, certainly, be taken as an indication of treatment

when contrasted with the other symptoms present.

In two cases, so very similar in almost all respects, I have been desirous of testing the curative effects of the wine of the seeds, and of the acetous extract of colchicum.

In the case of Dalgleish considerable improvement followed the bleeding, the pain on the four following days being felt only while walking or moving the extremity. During the following week, however, it again became worse; afterwards less, and for the last three or four days, remained stationary, although the colchicum wine had been increased to 40 minims three times a day. It was in consequence of this latter circumstance that the acetous extract was substituted for the wine of colchicum, in the hope of effecting a more speedy cure of the disease. How far this will be accomplished by this alteration, you will have an opportunity of observing.

Less improvement has been obtained by the treatment in Withers's case, although it has been the same as in the former case, with this difference only that the acetous extract instead of the wine of colchicum, was employed. The pain is much less severe, but it shifts, when relieved by leeching, from one part of the affected extremity to another, and will, probably, prove more obstinate than in the preceding case.

[The first of these patients was discharged cured on the 12th of February. The pain disappeared the day after the use of the acetous extract of colchicum, and did not return; the henbane and Dover's powder were, however, continued till the 9th, along with the colchicum, and, probably, assisted in expediting the cure. The other patient did not leave the hospital till the 23d, and then at his own request, and still suffered from considerable pain in the hip. Various means were employed, subsequently to the use of the acetous extract of colchicum, and when it no longer appeared to afford relief. The chief of these were the mistura guaiaci, the tinct. guaiac. ammoniat., the hip-bath, and acupuncture; each of which was followed for a short time by some diminution of the pain, (which was principally seated in the hip,) which, however, soon returned, and at last became stationary. At the end of a week after leaving the hospital this patient was readmitted, and was again under treatment for upwards of three weeks, the disease being, in all respects, as severe as on the previous occasion. In addition to the means formerly employed, he took the spirit. terebinth. for some time, and afterwards the ferri carbon. in large doses, with no great apparent advantage from either. Ten grains of Dover's powder, with the addition of half a grain of opium, were taken night and morning, and to this part of the treatment the patient ascribed the chief benefit he derived. He was this time "discharged cured."]

I take this opportunity of showing you in this patient, (the patient was brought into the theatre,) who was admitted for disease of the heart and bronchitis, a very good example of that form of cutaneous affection called by Willan, pityriasis versicolor, and by other dermatologists, *chloasma*, *maculæ*, *hepaticæ*, &c.; you perceive, principally on the chest and upper part of the abdomen, a number of spots and patches of very various dimensions, and of a yellowish-brown colour. A few of them are not larger than the surface of a split pea; the greater number of them vary from one to two inches in breadth, and several are considerably larger. The spots are of a round or oval shape; the patches are more or less irregular in their shape, and are obviously the result of the union of smaller ones, segments of which are seen forming the circumference of the former. The discoloured surfaces are smooth, except here and there, where there is a very slight furfuraceous desquamation; and when the hand is passed over them, it is only the larger ones which are felt to project slightly above the surface of the surrounding skin. They are the seat of a certain degree of pruritus, which is always increased by external warmth, by whatever excites the general circulation, as active exertion of all kinds, stimulating food, and spirituous liquors. Under these circumstances the sensation of itchiness is sometimes very annoying, and compels the patient to have recourse frequently to rubbing or scratching the affected parts to obtain relief. Generally, however, the itchiness in this affection is not so troublesome, and the chief annoyance is the unseemly appearance of the skin, more especially when the discolouration affects parts which cannot always be concealed by the dress.

The duration of this cutaneous affection is extremely variable. It has appeared to me that it is found to exist for a much longer period in males than in females. In the former I have known it to have existed for many years; and in the present case it has existed several years; whereas, in the latter, it not unfrequently disappears after a few weeks, or even a few days duration. It must, however, be observed, that in such cases the cutaneous discolouration has occurred in females at the menstrual periods, on suppression of the menses, or during pregnancy; and, hence, this form of the affection has been by some pathologists denominated *chloasma amenorrhicus*, and *chloasma gravidarum*. Its real or supposed occurrence in diseases of the liver (of which I have not met with an example,) has obtained for these patches the name of maculæ hepaticæ. It may no doubt occur along with disease of this or other organs; but it is frequently met with in persons apparently in good health, and who apply to the physician only in consequence of the itchiness and discolouration of the skin. The real nature and cause of the discolouration are not known. It is wrong, however, to assign to it an inflammatory origin, and to class it with the squamous diseases of the skin, as has been done by Willan and Bateman. By these authors it has, as I have already said, been called *pityriasis versicolor*. But pityriasis is, essentially, a chronic inflammatory affection of the skin; accompanied for the most part by some degree of inflammatory redness, by increase

of temperature of the affected parts, and constantly by desquamation, sometimes carried to a great extent. The discolouration of the affection of which I am now speaking, is not that which accompanies inflammation of the skin, and, therefore, ought not to be classed among the squamæ.

Its natural place is obviously among the *dischroa*, and whatever may be the causes to which it owes its origin, it appears to consist in an increase, or at least in a modification, of the colouring matter of the cutaneous tissue. This cutaneous affection, or chloasma, is, in general, easily distinguished from other similar affections. The obvious cause of *ephelis*, viz., exposure to the sun, and the appearance of the spots only on the parts thus exposed, are at once sufficient to establish a marked distinction between the two affections; and the distinction is made with the same facility in *lentigo*, from the freckles, as they are called, coinciding with the always reddish colour of the hair. *Nævi*, of a brownish colour, and which are not raised above the surface of the skin, bear some resemblance to circumscribed spots of chloasma, but are readily distinguished from it by the fact of their being congenital, and the absence of itchiness and desquamation. A much greater resemblance exists between chloasma and the *copper-coloured syphilitic patches*. From these latter, however it may also, in most cases, be distinguished by the previous history, by a difference of colour, and, *chiefly*, by the absence of pruritus.

The treatment of chloasma may be stated in a few words. The most effectual remedy is the sulphuret of potash, in the form of baths, or of vapour, and the sulphuric fume bath. I have seen the disease disappear entirely by one or other of these means, in a few weeks, that had resisted all others for years. Any complication must, of course, be treated apart, and those forms of chloasma which accompany disordered menstruation, or pregnancy, generally disappear on the removal of these states.—*Lancet.*

Concours for the Chair of Organic Chemistry at Paris.—The following brief notice of the *tests* to which the rival candidates *were submitted*, at the late *concours* for the chair of organic chemistry and pharmacology will probably be interesting to the American reader. The election by *concours* may, we will allow, be attended with some disadvantages, as it has been often remarked that professional and scientific men are generally the least impartial judges of professional and scientific merit; but that there are corresponding, and, we may add, overbalancing benefits from its adoption, cannot well be disputed.

The *first* examination was altogether occupied with the preparing of a written thesis upon the organic alkalis.

At the *second* examination, the candidates had to discourse orally, after twenty-four hours' preparation, upon a given subject—M. Baudrimont upon the chemical and pharmaceutical relations of alcohol; M. Bouchardat upon those of the essential oils; M. Bussy upon those of adipose and fatty matters; and M. Dumas upon those of sugar.

At the *third* examination—which was also an oral one, after two hours' preparation, upon a subject determined by lot—MM. Baudrimont and Bouchardat had to treat of the properties of albumen and gelatine, and MM. Bussy and Dumas upon those of milk.

At the *fourth* and last examination, the candidates were required to defend their respective printed theses—M. Bussy on the urine and its changes in diseases; M. Dumas upon the influence of heat on organic bodies, and its employment in pharmaceutical preparations; M. Bouchardat on the blood; and M. Baudrimont on the present state of organic chemistry.

Each candidate gave convincing proof of great knowledge and acquirements; but as the superiority of M. Dumas was acknowledged by all, he was unanimously elected to the professional chair.—*Med. Chir. Review.*

THE MEDICAL EXAMINER.

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We learn that Drs. Wood and Bache are preparing for the press a new edition of the United States Dispensatory. This will be the fourth edition, and, like the preceding, will probably be a large one. This excellent work is now generally introduced throughout the United States, and is equally necessary to physicians and druggists.

We give in the present number a translation of Professor Gerdy's Discourse at the Royal Academy of Medicine, on the distinction between the nerves of sensation and motion. This forms a part of a series of lectures and debates upon the subject, which have recently taken place at the Academy. Dr. Gerdy is well-known as a physiologist. We publish his lecture because it is in opposition to the commonly received notions upon this subject, and, although the grounds of his reasoning are not incontrovertible, it is well to hear both sides of the question.

The translation is literally correct, and made with great care; but we must apologize to our readers for a number of Gallicisms which will be found throughout it. The translator is a young physician, well acquainted with the French language, and with the subject; but, from want of practice in translating, he has rendered some passages so literally, that their meaning is somewhat obscured.